

## **Elektron™ 43- An introduction to a new aerospace wrought magnesium alloy from an engineering perspective**

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Elektron 43 is a new magnesium wrought alloy that has been developed to meet the increasing demand by aerospace design engineers to create light weight solutions in aircraft applications.

The revival of magnesium alloys in aerospace applications comes at a time when the FAA and various aerospace specification committees are altering their previously restrictive stance on magnesium usage in aircraft interiors. The FAA is altering their limiting position regarding the use of magnesium in aircraft seats as a result of positive results following extensive flammability testing. To support the uptake of magnesium, the SAE Aircraft Seat Committee are revising SAE Aerospace Specification 8049 to allow magnesium to be used once again in aircraft seats.

Elektron 43 has recently obtained AMS specification and approval for inclusion in the MMPDS handbook in both plate and extruded forms. An overview of the material will be presented from an engineering perspective and a comparison with other aerospace materials will be made in order to highlight the benefits of the application of magnesium in certain aerospace applications. This will include a summary of the material's mechanical properties in the extruded and plate forms and contrasted to common aerospace aluminum alloys.

1. Introduction
  1. Use verbage in abstract to introduce the alloy system. Provide highlights of presentation
2. History and evolution from a sand casting alloy
  1. Elektron 43 is an evolutiojn of a sandcasting alloy.
  2. WE43B has been extremely successful in many aerospace applications – show
  3. Elelkrton 43 is an evolution of this this family of alloys in to a wrought alloy- it needs to be deformed to attain its mechnacial propetrties – compare old extrusions with new extrusions. Graph compareing nromalised strengths of cast verses wrought
3. Development by ARL
  1. The transition from a casting alloy to a wrought plate alloy was achieve with funding provided by ARL that forged the way for what is now
4. What is Elektron 43? Alloy content, microstructure available forms
  1. Do a scale regression on the product Slab, plate, sheet, grain structure, microstructure, precipitate structure.
5. Specification position
  1. ASTM/AMS/ MMPDS for extrusions and plate.
6. Engineering properties
  1. Comparison with 2024, 6061 and 7075
7. Tensile props
8. Compression
9. Elevated properties
10. Derived properties
11. Modulus /tiffness
12. Effect of temperature
13. Fracture
14. Fatigue
15. Design
16. Welding and Joining
17. Coating Solutions and Galvanic Corrosion
18. Flammability
19. Conclusions and closing remarks